

ZAYEZDNIY, Aleksandr Mikhaylovich; KLYATSKIN, I.G., retsentsent; KHAVIN, V.P., retsentsent; SOBOLEVA, Ye.M., tekhn. red.

[Harmonics synthesis in radio engineering and electrical communications] Garmonicheskii sintez v radiotekhnike i elektrosvazi. Moskva, Gos.energ.izd-vo, 1961. 535 p. (MIRA 15:2)  
(Radio) (Telecommunication) (Harmonic analysis)

BRUNOV, Boris Yakovlevich, dotsent; GOL'DENBERG, Lev Moiseyevich, dotsent; KINATSKIN, Issy Gertsovich, prof.; TSEITLIN, Lev Aleksandrovich, dotsent; LOMONOSOV, V.Yu., prof., retsentsent; GOL'DIN, O.Ye., dotsent, red.; ZHITNIKOVA, O.S., tekhn.red.

[Theory of the electromagnetic field] Teoriia elektromagnitnogo polia. By B.IA.Brunov i dr. Moskva, Gosenergoizdat, 1962.  
511 p. (MIRA 15:5)

(Electric fields)

(Magnetic fields)

VRASKIY, S.B.; KLYATSKIN, I.G., prof., red.; GAL'CHINSKAYA, V.V.,  
tekhn. red.

[Physical foundations of the special theory of relativity;  
textbook for students] Fizicheskie osnovy chastnoi teorii  
otnositel'nosti; uchebnoe posobie dlia studentov. Pod red.  
I.G.Kliatskina. Leningrad, Leningr. elektrotekhn. in-t  
svyazi im. M.A.Bonch-Bruевичa, 1961. 100 p. (MIRA 17:2)

8/108/63/018/001/001/011  
D201/D308

AUTHOR: Klyatskin, I.G. Member of the Society (see Association)

TITLE: Application of operational calculus to the analysis of periodic processes

PERIODICAL: Radiotekhnika, v. 18, no. 1, 1963, 3-11

TEXT: By applying the Laplace transformation the author solves the problem of the steady state response of a linear system with lumped constants, excited by periodical pulses. The expressions for the steady state response of the system are derived for the case when the polynomial in the denominator of the Laplace transform has  $n$  different roots, and separately for a multiple root. These expressions are useful in problems involving any linear system with lumped parameters.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A.S. Popova (Scientific and Tech-

Card 1/2

Application of operational calculus ... S/108/63/018/001/001/011  
D201/D308

nical Society of Radio Engineering and Electrical  
Communications imeni A.S. Popov) / Abstracter's  
note: Name of Association taken from first page of  
journal

SUBMITTED: September 7, 1962

Card 2/2

KLYATSKIN, I.O.

Training of radio engineers. Radiotekhnika 18 no.5:66-70  
My '63. (MIRA 16:8)

1. Deystvital'nyy ohlen Nauchno-tehnicheskogo obshchestva  
radiotekhniki i elektrosvyazi imeni Popova.

(Electric engineers—Education and training)  
(Radio—Study and teaching)

KLYATSKIN, I.G.

Inconsistency of the integral equation for antennas. Dokl. AN SSSR  
152 no.5:1064-1072 0 '63. (MIRA 16:12)

1. Leningradskiy elektrotekhnicheskiy institut svyazi im. M.A.  
Bonch-Bruyevicha.

KLYATSKIN, I.G.

Solution of a differential equation with a periodic right member. Trudy ucheb. inst. svyazi no.14:3-8 '63.

(MCRA 17:9)

1. Leningradskiy elektrotekhnicheskiy institut svyazi im. prof. M.A. Bonch-Bruyevicha.

KLYATSKIN, I.G.

Integral equation of an antenna and induced e.m.f. techniques.  
Radiotekhnika 19 no. 4:5-16 Ap '64. (MIRA 17:5)

1. Pochetnyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki  
i elektrosvyazi imeni A.S. Popova.

ACCESSION NR: AP4029455

S/0108/64/019/004/0005/0016

AUTHOR: Klyatskin, I. G. (Honorary member)

TITLE: Integral equation of an antenna and the method of induced emf [ Report at NTORIE, Leningrad, 7Mar63 ]

SOURCE: Radiotekhnika, v. 19, no. 4, 1964, 5-16

TOPIC TAGS: antenna, antenna theory, antenna integral equation, induced emf method, radio communication

ABSTRACT: The development of E. Hallen's (Nova Acta, Uppsala, no. 4, 1938) transmitting-antenna integral equation (10) is criticized on the grounds that it neglects the lateral field intensity created by the exciting device. The neglectance was justified by the fact that the exciting field moment in the gap is very small due to the small gap length for electric currents or due to a small cross-section of the conductor for magnetic currents. The present article refutes this

Cord 1/2

KLYATSKIN, I.G.

Reply to V.B. Zalmanzon's letter. Radiotekhnika 19 no.6:76  
Je '64. (MIRA 17:10)

1. Pochetnyy chlen Nauchno-tekhnicheskogo obshchestva radio-  
tekhniki i elektrosvyazi imeni Popova.

KLYATSKIN, I.G.

Reply to M.S. Neiman's article "Radiation of antennas".  
Radiotekhnika 20 no. 12:27-33 D '65 (MIRA 19:1)

1. Pochetnyy chlen Nauchno-tekhnicheskogo obshchestva radio-  
tekhniki i elektrosvyazi imeni Popova.

ACC NR: AR6026492

SOURCE CODE: UR/0274/66/000/004/A041/A042

AUTHOR: Klyatskin, I. G.

TITLE: Method of induced electromotive forces

SOURCE: Ref. zh. Radiotekhnika i elektrosvyaz', Abs. 4A274

REF SOURCE: Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR, vyp. 26, 1965, 3-8

TOPIC TAGS: antenna theory, antenna engineering

ABSTRACT: The physical meaning of the induced-emf method is considered, and a formula is derived for determining the input impedance of an antenna. The often-used formula for the input impedance is unsatisfactory; it yields the correct results only when the current is distributed along the antenna sinusoidally. Bibliography of 4 titles. A. M. [Translation of abstract]

SUB CODE: 09

Card 1/1

UDC: 621.396.671

RYABYKH, P.M.; KLYATSKIN, I.M.

We are raising the technical level of new plants. Neftianik 7  
no.1:22 Ja. '62. (MIRA 15:2)

1. Glavnyy inzh. Gosudarstvennogo instituta po proyektirovaniyu  
neftepererabatyvayushchikh zavodov (for Ryabykh).  
(Petroleum refineries)

~~ILYATSKIN, O.O.~~

The struggle against the personality cult and its consequences.  
Blok.agit.vod.transp. no.14:18-25 J1 '56. (MIRA 9'9)

1. Agitator Moskovskogo Severnogo rechnogo porta.  
(Communist Party of the Soviet Union)

ACC NR: AP7001574

(N)

SOURCE CODE: UR/0421/66/000/006/0087/0092

AUTHOR: Klyatskin, V. I. (Moscow)

ORG: none

TITLE: Generation of sound by a vortex system

SOURCE: AN SSSR. Izvestiya. Mekhanika zhidkosti i gaza, no. 6, 1966, 87-92

TOPIC TAGS: fluid dynamics, sound propagation, sound generation, sound wave, vortex flow, turbulent flow

ABSTRACT: The problem of acoustic radiation from turbulence is considered. The generation of sound in a weakly compressible medium by elementary vortex formations: 1) two vortex lines of equal intensities radiating cylindrical waves, and 2) two vortex rings of equal intensities radiating spherical waves is investigated by using the Lighthill approach. Expressions are derived for the intensity of the sound field and the radiation energy flux for both cases. It is shown that the intensity of sound in the first case is proportional to  $M^4$  where the Mach number  $M = \kappa/2hc$ ,  $\kappa$  is the intensity of the vortex,  $2h$  is the distance between vortices, and  $c$  is the speed of sound. In the second case, the intensity of sound is proportional to  $M^5$  and the energy radiation is of quadrupole nature. This agrees well with the results obtained by Lighthill. Orig. art. has: 40 formulas. [AB]

SUB CODE: 20/ SUBM DATE: 02Jun66/ ORIG REF: 002/ OTH REF: 004/ ATD PRESS:5110

Card 1/1

L 06520-67 INT(1) CW

ACC NR: AP7000442

SOURCE CODE: UR/0362/66/002/005/0474/0485

AUTHOR: Kiyatskin, V. I.

ORG: Institute of Physics of the Atmosphere, AN SSSR (Institut fiziki atmosfery AN SSSR)

TITLE: Homogeneous and isotropic turbulence in slightly compressible medium

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 2, no. 3, 1966, 474-485

TOPIC TAGS: atmospheric turbulence, turbulent flow

ABSTRACT: The author has investigated homogeneous, isotropic turbulence in a slightly compressible medium. The equations of hydromechanics are linearized for the values describing the acoustic field, conserving its interaction with the eddy field. A qualitative study was made of the role of inertial forces and pressure forces in the change of energy of such a medium. An equation is derived which represents an expansion of the balance equation for total energy for the small parameter  $\beta = u_p/u$  -- the ratio of the characteristic values of the fluctuations of the potential and solenoidal components of velocity. In a slightly compressible turbulent flow in the presence of foreign random acoustical waves the value is proportional to the Mach number  $M = u_s/c$ . However, if there are only fluctuations of density, generated by the flow itself, in this case  $\beta \sim M^2$ . Orig. art. has: 28 formulas.

JPRS: 37,058  
Cord 1/2

L 06520-67

ACC NR: AP7000442

3  
The author thanks A. M. Obukhov, G. S. Golitsyn, and Ye. A. Novikov for discussion of the results and for advice during the process of carrying out the work.

SUB CODE: 004/ SUBM DATE: 02 Dec 65 / ORIG REF: 009 / OTH REF: 006

Card 2/2 15

NESIS, A.I.; VINARIK, E.M.; DVOYRE, V.L.; DZEMGOZINA, D.M.;  
KLYATSKAYA, I.Ye.; FADEYEVA, Ye.I.; SHAYDAN, I.M.; IVAKINA, T.P.

Regression of experimental silicosis under the influence of  
hydrocortisone. Izv. AN Kazakh. SSR Ser. med. nauk 11 no.3:  
44-49 '64 (MIRA 18:1)

KLIATSKIY, M.S., starshiy prepodavatel'

Effect of technological factors on the efficiency and surface smoothness in lapping with abrasive pastes. Nauch. zap. KHIMSKH no.11 Fak. mekh. sel'khoz. 1:109-130 '58. (MIRA 14:3)

1. Kafedra tekhnologii metallov Khar'kovskogo instituta mekhanizatsii sel'skogo khozyaystva.  
(Grinding and polishing)

KUSHNIR, A.I. [Kushnyr, A.I.]; KAZIMIRCHUK, Yu.A. [Kasymyrohuk, Yu.A.];  
OLOVATSKIY, S.M. [Hlovatskyi, S.M.]; KLYATSKIY, T.A. [Kliats'kyi,  
T.A.], red.; KALASHNIKOVA, O.G. [Kalashnykova, O.H.], tekhn.  
red.

[How we control soil erosion] Iak my boremosia z eroziieiu  
gruntiv. Kyiv, Derzh. vyd-vo sil's'konospodars'koi lit-ry  
URSR, 1961. 12 p. (MIRA 15:3)  
(Ukraine--Soil conservation)

KLYATSOV, M.

Unit for scouring sprayer outlets. Avt.transp. 41 no.1355 Ja  
'63. (MIRA 16:2)

(Fuel pumps—Cleaning)

FILIP'YEV, Yuriy Aleksandrovich; LAVRETSKIY, A., doktor fil.  
nauk, otv. red.; KLYAUS, Ye.M., red.izd-va; MATYJKHINA,  
L.I., tekhn. red.

[Creativity and cybernetics] Tvorchestvo i kibernetika.  
Moskva, Izd-vo "Nauka," 1964. 78 p. (MIRZ 17:3)

MAYZITS, Ya.; KLIJVA, A.; KLUQA, L.

Composition and anthelmintic action of tansy. Kim. Inst. Zinātnisk. Raksti,  
Latvijas PSR Zinātnu Akad. 1, 101-26 '50.  
(GA 47 no.19:10175 '53)

ACC NR: AFG037024

(A,N)

SOURCE CODE: UR/0181/66/001/011/3449/3450

AUTHOR: Vavilov, V. S.; Koshelev, O. G.; Koval', Yu. P.; Kiyava, Ya. G.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Investigation of the inter-impurity recombination between phosphorus and boron in silicon

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3449-3450

TOPIC TAGS: silicon semiconductor, radiative recombination, epr spectrum, temperature dependence, impurity conductivity, activation energy

ABSTRACT: In view of lack of data on the temperature dependence of inter-impurity recombination, the authors used electron paramagnetic resonance to study this recombination in silicon at temperatures 4.2K and below. The procedure used was that developed by A. Honig and R. Enck (Proceedings of Symposium on Radiative Recombination in Semiconductors, Paris, July, 1964). The investigations were made on two samples containing different phosphorus and boron concentrations. To disturb the equilibrium in the distribution of the electrons between the boron and the phosphorus, the sample was illuminated by a pulse of light from an infrared monochromator. The EPR spectra were recorded at different intervals after turning off the light. The time dependence of the neutral phosphorus atoms was determined by measuring the amplitudes of the lines. The results have shown that the equilibrium is not established exponentially,

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ACC NR: AF6037024

owing to the uneven distribution of the impurity atoms. The rate of inter-impurity recombination depends strongly on the impurity concentration and increases with decreasing temperature. The time during which the excess concentration of neutral atoms of phosphorus decreases by a factor  $e$  is found to be  $\tau = \tau_0 \exp(\Delta E/kT)$ , where  $\Delta E = 5 \times 10^{-4}$  ev and  $\tau_0 = 8$  sec ( $T$  = temperature,  $k$  = Boltzmann's constant). It is noted that  $\Delta E$  is of the same order of magnitude as the activation energy corresponding to the temperature dependence of the impurity conductivity of copper atoms in germanium and phosphorus and boron atoms in silicon. Consequently, measurement of  $\Delta E$  over a wide temperature interval and measurement of the activation energy in the same samples would permit a more thorough study of inter-impurity recombination. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 18Jun66/ ORIG REF: 003/ OTH REF: 006

Cord 2/2

BISSENEK, Nikolay Yakovlevich [Bissenieks, N.]; KLJAVIN', E. [Klavins, E.],  
red.; KLYUMEL', A., tekhn. red.

[Plant corn in the fields of Latvia] Kukurusu - na polia Latvii!  
Riga, Latviiskoe gos. izd-vo, 1959. 53 p. (MIRA 14:11)  
(Latvia—Corn (Maize))

MOSKOVKINA, Emiliya Genrikhovna; SAVEL'YEV, Dmitriy Andreyevich;  
KLYAVIN', E., red.

[Conservation in the Latvian S.S.R.; collection of laws,  
decrees and regulations on conservation] Okhrana prirody  
v Latviiskoi SSR; sbornik zakonov, postanovlenii i polo-  
zhenii po okhrane prirody. Riga, Latviiskoe gos. izd-vo,  
1963. 195 p. (MIRA 17:5)

1. Latvian S.S.R. Laws, statutes, etc.

KLYAVIN, E. P.

KLYAVIN, E. P. -- "Selection of Rational Profiles of Stone Arches." Latvian State U, 1954  
(Dissertation for the Degree of Candidate of Technical Sciences)

90: Izvestiya Ak. Nauk Latvyskov. SSR, No. 9, Sept., 1955



24(6)

PHASE I BOOK EXPLOITATION

SOV/2385

Akademiya nauk SSSR

Nekotoryye problemy prochnosti tverdogo tela; sbornik statey (Some Problems in the Strength of Solids; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 386 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V. I. Aver'yanov; Tech. Ed.: R. S. Pavzner;  
Editorial Board: A. F. Ioffe, Academician; G. V. Kurdyumov, Academician;  
S. N. Zhurkov, Corresponding Member, USSR Academy of Sciences; B. P.  
Konstantinov, Corresponding Member, USSR Academy of Sciences; F. F. Vitman,  
Doctor of Physical and Mathematical Sciences, Professor (Resp. Ed.); L. A.  
Glikman, Doctor of Technical Sciences, Professor; N. A. Zlatin, Doctor of  
Physical and Mathematical Sciences; V. A. Stepanov, Doctor of Technical  
Sciences; Ya. B. Fridman, Doctor of Technical Sciences, Professor; B. S. Ioffe,  
Candidate of Technical Sciences (Deputy Resp. Ed.).

PURPOSE: This book is intended for construction engineers, technologists, physicists and other persons interested in the strength of materials.

COVERAGE: This collection of articles was compiled by the Otdeleniye fiziko-matematicheskikh nauk AN SSSR (Department of Physical and Mathematical Sciences) and the Fiziko-tekhnicheskii institut AN SSSR (Institute of Applied Physics,  
Card 1/10

Some Problems in the Strength (Cont.)

90V/2385

Academy of Sciences, USSR) in commemoration of the 80th birthday of Nikolay Nikolayevich Davidenkov, Member of the Ukrainian Academy of Sciences, founder and head of the Otdel prochnosti materialov (Department of the Strength of Materials) at the Institute of Applied Physics, Academy of Sciences, USSR, founder of the Fakul'tet fizicheskogo metallovedeniya (Department of Physical Metallurgy) at the Leningradskiy politekhnicheskii institut (Leningrad Polytechnic Institute), recipient of the Stalin Prize (1943), the Order of the Red Banner of Labor (1945) and the Order of Lenin (1953). The articles deal with the strength of materials, phenomena of imperfect elasticity, temper brittleness, hydrogen embrittlement, cold brittleness, influence of deformation speed on the mechanical properties of materials, fatigue of metals, and general problems of the strength, plasticity, and mechanical properties of nonmetals. Numerous personalities are mentioned in the introductory profile of Professor Davidenkov. References are given at the end of each article.

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Some Problems in the Strength (Cont.)

90V/2385

Rovinskiy, B. M., and V.M. Sinayskiy (Institut mashinovedeniya AN USSR g. Moskva (Institute of Mechanical Engineering, Academy of Sciences, USSR, Moscow). Investigation of Individual Grain Deformation in a Polycrystalline Body During Simple Tension

49

Klyavin, O.Y., and B. I. Smirnov (Fiziko-tekhnicheskiy institut AN SSSR g. Leningrad - Institute of Applied Physics, Academy of Sciences, USSR, Leningrad). Study of the Width of X-ray Lines of Nickel Deformed at 4.2°K

56

Gindin, I.A., B.G. Lazarev, Ya.D. Starodubov, and V.I. Khotkevich (Fiziko-tekhnicheskiy institut AN USSR-Institute of Applied Physics, Academy of Sciences Ukr. SSR, Khar'kov). Low-temperature Polymorphism of Metals

61

Zhurkov, S.N., and E.Ye. Tomshhevskiy (Institute of Applied Physics, Academy of Sciences, USSR, Leningrad). Time Dependency of Strength Under Different Load Conditions

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Some Problems in the Strength (Cont.)

SOV/2385

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g. Khar'kov State University imeni Gor'kiy, Khar'kov). Diffusion Creep of  
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USSR, Sverdlovsk). Influence of Aluminum and Copper on the Deformation  
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Between the Mechanical and Thermal Characteristics of Crystals
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Some Problems in the Strength (Cont.)

80V/2385

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- Olikman, L.A., and N.N. Kolgatin (NI $\dot{I}$  po pererabotke nefi i polucheniya iskusstvennogo zhidkogo topliva, g. Leningrad-Scientific Research Institute for Petroleum Refining and Production of Synthetic Liquid Fuels, Leningrad). Nature of the Physical Yield Point of Steel 130
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Some Problems in the Strength (Cont.)

80V/2385

Sokolov, Ye.N., V.D. Sadovskiy, and S.N. Petrova (Institute for Metal Physics, Ural Branch, Academy of Sciences, USSR, Sverdlovsk) Structure of Austenite Grain Boundaries and the Temper Brittleness of Structural Steel 165

Ageyev, N.V., and V.A. Trapeznikov (Institut metallurgii AN SSSR, g. Moskva - Metallurgical Institute, Academy of Sciences, USSR, Moscow). Influence of the Degree of Purity on Cold Brittleness and Other Properties of Chromium 172

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Some Problems in the Strength (Cont.)

SOV/2385

- Vitman, F.F., and V.A. Stepanov (Institute of Applied Physics, Academy of Sciences, USSR, Leningrad). Influence of Deformation Rate on the Deformation Resistance of Metals at Impact Speeds of  $10^2$  -  $10^3$  m/sec 207
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Some Problems in the Strength (Cont.)

SOV/2385

- Burmakina, O.P., and P.S. Savitskiy (Sverdlovskiy filial VNI metrologii imeni Mendeleeva-All-Union Scientific Research Institute of Metrology imeni Mendeleev, Sverdlovsk Branch). Mechanical Properties of Tempered Steel Under Biaxial Tension 334
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- Stepanov, V.A., and L.O. Khodakova (Institute of Applied Physics, Academy of Sciences, Leningrad). Measuring Residual Stresses in Tempered Glasses by the Mechanical Method 348
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- Card 940

Some Problems in the Strength (Cont.)

80V/2385

Regel', V. R., and G.V. Barashkova (Crystallography Institute, Academy of Sciences, USSR, Moscow). Effect of the Type of Stressed State on Flow-Curve Parameters of Some Plastics

375

AVAILABLE: Library of Congress

Card 10/10

TM/fal  
10-15-59

**KLYAVIN, O.V.; STEPANOV, A.V.**

Study of the mechanical properties of solids, especially metals, at 4.2°K and lower. Part 2: Rupture test of coarse crystalline aluminum (99.99% o/o) and of the superfluid aluminum alloy V-95. Fiz. tver. tela 1 no.6:955-959 Ja '59. (MIRA 12:10)

1. Leningradskiy fiziko-tekhnicheskii institut AN SSSR.  
(Aluminum--Testing) (Low temperature research)

66281

SOV/181-1-11-16/27

~~24(6)~~ 24,5600

AUTHORS: Klyavin, O. V., Stepanov, A. V.

TITLE: Study of the Mechanic Properties of Metals at the Temperature of Liquid Helium

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 11, pp 1733 - 1735 (USSR)

ABSTRACT: At the third (1956) and fourth (1957) All-Union Conference for the Physics of Low Temperatures reports were given on the following investigations: The extension diagrams of the metals Al, Pb, Cu, Ni, Ta, Ti, Cd, Fe-Armco, alloy V-95, steel-3,  $\alpha$ -brass and of plexiglass were measured at 300, 78, 4, 2 and 1.6°K. The following information has been derived from the main results: 1) for the measuring of the extension at temperatures from 4.2 to 1.3°K a method and a corresponding measuring instrument were developed. 2) In the temperature range 4.2 - 1.6°K the temperature has an influence on the mechanic properties of the samples. 3) Numerous jumps occur in the extension diagrams of many metals and alloys, which cannot be explained as yet. 4) A change in the rupture character of aluminum was observed in the range from 4.2 to 1.6°K. 5) The plasticity is maintained in all metals and  $\alpha$ -brass up to 1.6°K. Extension is larger with Al, Cu, Ni and Pb than at 300°K. In Fe-Armco and Ta a noticeable increase of the modulus of elasticity can be observed. 6) In

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66281

Study of the Mechanic Properties of Metals at the SOV/181-1-11-16/27  
Temperature of Liquid Helium

aluminum an increase of the real rupture resistance ( $S_k$ ) up to 150 kg/mm<sup>2</sup> can be observed. 7) The influence of temperature on the mechanical properties of the aluminum alloy V-95 (in hardened or non-hardened state) and steel-3 is small. It is generally valid that at lower temperatures the strength (solidity or toughness) of the alloys is less than that of the pure metals from which the alloys have been prepared. 8) For aluminum of a purity of 99.3% (hardened or non-hardened) the measured characteristic quantities summarized in table 1. 9) Figure 1 gives a graphic illustration of the plastic deformations of non-hardened Al of 99.3% purity at T=300°K and after deformation at T=4.2 and 1.6°K with  $\epsilon_{\text{pl}}$  19%. The curves are not in accordance with one another. The chief of the Laboratory of Low Temperatures, N. M. Reynov supported these investigations by helpful assistance. There are 1 figure, 1 table, and 11 references, 8 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskii institut AN SSSR, Leningrad (Physico-technical Institute of the AS USSR, Leningrad)

SUBMITTED: March 24, 1959  
Card 2/2

4

**AUTHORS:** Klyavin, O.V. and Stepanov, A.V. <sup>SOV/126-8-2-17/26</sup>

**TITLE:** Study of Mechanical Properties of Solids, Especially Metals, at 4.2 °K Absolute and Lower. I. Testing Polycrystalline Aluminium (99.3%) to Fracture

**PERIODICAL:** Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 2, pp 274 - 281 (USSR)

**ABSTRACT:** Tests were carried out on a machine due to A.V. Stepanov (Ref 10) shown in Figure 1. The lower part was placed in a vessel containing liquid nitrogen, which was in turn immersed in liquid helium. Measurements were carried out by an elastic dynamometer. Elongation was measured to  $\pm 0.01$  mm. The rate of elongation was 0.4 - 1.6 mm per minute. The aluminium used contained 0.05% Cu, 0.3% Fe, 0.35% Si and 0.1% other impurities. Samples were heated in vacuo for one hour at 300 °C and furnace-cooled for 3-4 hours. Results are given in Table 1 and Figure 1. The plasticity of aluminium is maintained down to 1.6 °K. The curve at 1.6 °K has a kink just before fracture. At 4.2 °K, the sample fractures with very little necking but at 1.6 °K necking again appears. The

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SOV/126-8-2-17/26

Study of Mechanical Properties of Solids, Especially Metals, at 4.2°K Absolute and Lower. I. Testing Polycrystalline Aluminium (99.3%) to Fracture

type of fracture is shown in Figure 4 (going from left to right, test temperatures are 300, 78, 4.2, 1.6°K). At 1.6°K, the strength is very high and of the order of 150 kg/mm<sup>2</sup>. Figure 5 shows the relationship between strength and temperature. If this curve is extrapolated the theoretical strength (800 kg/mm<sup>2</sup>) is reached at 0.3°K. Thus, tests at lower temperatures are required. The strengths already obtained are of the same order as those obtained for metal whiskers. Tests on unannealed aluminium gave similar results. Plasticity at 1.6°K is 5 times greater than at 300°K (Figure 6). The types of fracture are similar to those for annealed aluminium (Figure 7) and at 1.6°K kinks are observed in the curve just before fracture.

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SOV/126-8-2-17/26

*Study of Mechanical Properties of Solids, Especially Metals, at 4.2° K Absolute and Lower. I. Testing polycrystalline Aluminium (99.3%) to Fracture*

There are 7 figures, 2 tables and 13 references, 5 of which are English, 1 German and 7 Soviet.

ASSOCIATION: Leningradskiy fiziko-tehnicheskii institut ANSSSR  
(Leningrad Physico-technical Institute of the  
Ac.Sc., USSR)

SUBMITTED: July 11, 1958

Card 3/3

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5.4200

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SOV/126-8-6-21/24

AUTHORS:

Kiyavin, O.V. and Stepanov, A.V.

TITLE:

Study of the Mechanical Properties of Solids, Especially Metals at a Temperature of 4.2°K and Lower. III. Mechanical Properties of Iron, Titanium, Tantalum and St 2<sup>at</sup> at a Temperature of 4.2°K and Lower

PERIODICAL:

Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 6, pp 922-927 (USSR)

ABSTRACT:

This work, which is a continuation of published work (Ref 1,2), used the same procedures and test-piece dimensions. It was reported at the XI Scientific-Technical Session on Heat-Resisting Non-Scaling Alloys and Cermets (Moscow 1957) and the IV All-Union Meeting on Low-Temperature Physics (Moscow, July 1957). The iron used was Armco grade, specimens burned from 12 mm diameter rod being polished with emery paper (14 micron grains) and vacuum annealed at 600°C for 1 hour. The stress-strain diagrams for 300, 78, 4.2 and 1.6°K are shown in Fig 1, details of the mechanical properties being given in Table 1, which include results obtained by some other methods. Fig 2a shows the fracture region of iron at 4.2°K. The work showed that there is practically no

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67673

SOV/126-8-6-21/24

Study of the Mechanical Properties of Solids, Especially Metals, at a Temperature of 4.2°K and Lower. III. Mechanical Properties of Iron, Titanium, Tantalum and St 2 at a Temperature of 4.2°K and Lower

uniform plastic elongation at low temperatures. Similar results were obtained later in the USA (Ref 5,6). The titanium (0.13% Fe, 0.14% Ni, 0.07% C, 0.072% N<sub>2</sub>) specimens were prepared in the same way from 10 mm diameter rod, the annealing temperature being 800°C. Test results are shown in Table 2 and Fig 2, the effect of low temperatures on the properties being similar to those for iron with increasing yield-point stress and disappearance of uniform elongation. Tantalum (0.63% Nb, 0.1% Ti, 0.004% Si, 0.025% Mo, 0.039% W) specimens were turned from 8 mm diameter rod and vacuum annealed at 1100°C for 2 hours. The results are shown in table 3 and Fig 4 and are similar to those for iron. Fig 2<sup>5</sup> shows the fracture region of a tantalum test piece at 4.2°K. No differences in mechanical properties for the superconducting and non-superconducting regions were observed. The preparation of specimens of St 2 steel (0.2% C) was identical to that of iron specimens. The results are shown in Table 4 and Fig 5. With this, as with the other,

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8/181/60/002/008/030/045  
B006/B063

24.4500

AUTHOR:

Klyavin, D. V.

RECEIVED

Continued Experiment of Solid at a Temperature of 3.2° K  
on the Mechanical Properties of Aluminum, Copper, and Nickel

PERIODICAL: *Fizika tverdogo tela*, 1960, Vol. 2, No. 8, pp. 1891 - 1899

TEXT: The author of the present article gives a report on the results of the following experiments: Aluminum of a purity of 99.3% 1) was annealed and then subjected to a 15% tensile deformation at 4.2°K. After the specimen had recovered, it was heated and further deformed at 300°K until it was destroyed. 2) Two annealed specimens were subjected to a 19% preliminary deformation at 300°K, after which one specimen was deformed at 4.2°K, and the other at 1.6°K until they were destroyed. 3) Two non-annealed specimens were subjected to plastic deformation at 4.2° and 1.6°K, respectively (data in Table 1), after which they were further deformed at 1.6° and 4.2°K, respectively, until they were destroyed. Two annealed copper specimens of a purity of 99.9%: 1) were plastically

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83011

Mechanical Properties of Solids at a Temperature of 4.2°K and Below. V. The Effect of a Preceding Plastic Deformation on the Mechanical Properties of Aluminum, Copper, and Nickel

5/181/60/002/008/030/045  
B006/B063

deformed at 4.2°K, one of them by 14% and the other by 41%. After they had recovered, they were heated to 300°K within 17 min and then deformed at room temperature until they were destroyed. 2) An annealed specimen was subjected to a 34% deformation at 300°K. After it had recovered, it was further deformed at 4.2°K until it was destroyed. 3) Non-annealed specimens underwent a previous deformation at 300°K, after which they were destroyed at 4.2°K. The results obtained are given in Fig. 3 and Table 2. Nickel of a purity of 99.94% was 1) annealed, stretched by 23% at 300°K, further stretched by 1.5, 4.5, 8.0, and 15.5% at 4.2°K, and finally destroyed. 2) Three annealed specimens were stretched by 10, 17.5, and 26.5% at 4.2°K. After they had recovered, they were further deformed at 300°K until they were destroyed. Numerical results are given in Fig. 5 and Table 3. Summing up: The stretch diagrams of the previously deformed specimens are no simple functions of the experimental temperature, but depend on the kind, degree, and temperature of the previous deformation. A previous deformation at 1.6° and 4.2°K has a strong effect on the strength and plasticity of the metals investigated. The plasticity

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83011

Mechanical Properties of Solids at a Temperature of 4.2°K and Below. V. The Effect of a Preceding Plastic Deformation on the Mechanical Properties of Aluminum, Copper, and Nickel S/181/60/002/008/030/045 B006/B063

characteristics of the non-annealed specimens found at 1.6° and 4.2°K differed from those found at 300°K to a greater extent than in the case of annealed specimens. It was found that previous deformation and hardening at 300°K influenced the kind and number of discontinuities of the characteristics at 1.6°K (for aluminum) and 4.2°K (for copper). This effect was not found in the case of nickel. The stretch diagram shows that nickel and copper had a "fluidity area" at 4.2°K after they had been previously deformed at 300°K. The existence, number, and kind of the discontinuities occurring at 1.6° and 4.2°K depend on 1) the experimental temperature, 2) the initial state of the structure of the material, and 3) on the material itself and its degree of purity. The author thanks Professor A. V. Stepanov for his supervision of and interest in this work, and N. M. Reynov, head of the Cryogen Laboratory of the Leningrad Institute of Physics and Technology of the AS USSR, for his assistance. There are 5 figures and 11 references: 9 Soviet, 1 US, and 1 British.

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Mechanical Properties of Solids at a Tempera- 83011  
ture of 4.2°K and Below. V. The Effect of a 8/181/60/002/008/030/045  
Preceding Plastic Deformation on the Mechanical B006/B063  
Properties of Aluminum,  
Copper, and Nickel

ASSOCIATION: Leningradskiy fiziko-tehnicheskii institut AN SSSR  
(Leningrad Institute of Physics and Technology of the  
AS USSR)

SUBMITTED: January 18, 1960

X

Card 4/4

S/126/60/009/05/025/025

EO73/E335

**AUTHORS:** Klyavin, O.V. and Stepanov, A.V.

**TITLE:** Postscript to the Paper "Study of the Mechanical Properties of Solids, Particularly Metals, at the Temperature 4.2 °K and less. 1. Tensile Test of Polycrystalline Aluminium (99.3%)" (Same Journal, 1959, Vol 8, Nr 2, p 274)

**PERIODICAL:** Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 5, p 800 (USSR)

**ABSTRACT:** The authors of the paper express their acknowledgment to the Head of the Cryogenic Laboratory of the Fiziko-tekhnicheskii institut AN SSSR (Physics-engineering Institute of the Ac.Sc., USSR), N.M. Reynov, and to the employees of the Institute - G.A. Gukasov, G.N. Andreyev and M.F. Stel'makh for their considerable assistance in carrying out the work described in the paper. The information contained therein was presented at the Third All-Union Conference on Low-temperature Physics, Leningrad, June, 1956. ✓

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A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 9, pp. 257-258,  
# 21427

AUTHORS: Kiyavin, O.V., Smirnov, B.I.

TITLE: Studying the Width of Roentgen Lines of Nickel, Deformed at 4.2°K

PERIODICAL: V sb.: Nekotoryye probl. prochnosti i verdogo tela, Moscow-Lenin-  
grad, AN SSSR, 1959, pp. 56-60

TEXT: The authors investigated the width of the reflex (420) of Ni deformed by elongation at 4.2, 77°K and room temperature, and changes in width during annealing up to 700°C. It was found that the width increased with a higher deformation degree and dropping temperature of deformation; in the case of stepped deformation of the specimen at various temperatures, it was established that the changes in the width depended on the temperature of the preceding deformation. The authors note the similar course of curves of changes in width and elongation

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Studying the Width of Roentgen Lines of Nickel, Deformed at 4.2°K

curves. It is established that the temperature of eliminating crystal lattice distortions during annealing process is the lower, the lower the temperature of deformation of the specimen. There are 14 references. ✓

A.B.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

KLYAVIN, O.V.

Mechanical properties of solids at  $4.2^{\circ}\text{K}$  and below. Part 5: Effect of preliminary plastic deformation on the mechanical properties of aluminum, copper, and nickel. Fiz. tver. tela 2 no.8:1891-1899 Ag '60.  
(MIRA 13:8)

1. Leningradskiy fiziko-tehnicheskii institut AN SSSR.  
(Metals at low temperatures)

KLYAVIN, O.V.; STEPANOV, A.V.

Certain regularities in the effect of heat treatment on the indices  
of steel hardness. Fiz. met. i metalloved. 9 no.5:797-800 My '60.

(MIRA 14:4)

(Steel—Heat treatment)  
(Hardness)

23100  
S/181/61/003/005/005/042  
B101/B214

9.4300 (1055, 1469, 1072)

AUTHORS: Klyavin, O. V. and Smirnov, B. I.

TITLE: Study of the x-ray line-width of aluminum deformed at 4.2°K

PERIODICAL: Fizika tverdogo tela, v. 3, no. 5, 1961, 1335-1337

TEXT: The object of the work was to extend the data on the broadening of the x-ray lines of deformed aluminum to temperatures lower than those studied so far. The aluminum studied was of the type ABOOO (AYOOO) which was deformed at 300, 77, and 4.2°K. The 20 · 0.5 · 5 mm large sample was heated at 150°O in vacuum ( $10^{-4}$  mm Hg) and then stretched at a rate of 1.6 mm/min and the same temperature by an apparatus described in Ref. 9 (O. V. Klyavin, A. V. Stepanov, PMM, 8, 274, 1959). The x-ray pictures were taken at 300°K, by means of YPC-50M(URS-50I). The 200 and 400 interference line in the  $K_{\alpha}$  radiation of iron was investigated. The following results were obtained (Fig. 2): 1) Initially, the width of the line increases rapidly with deformation; 2) the increase of width at lower deformations is larger; 3) the curve of the line broadening becomes gradually flatter, as deformation increases. The quantity D of the block and its

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23100

Study of the x-ray ...

S/181/61/003/005/005/042  
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distortion  $\Delta d/d$  of the second kind was calculated on the strength of the broadening of the 200 and 400 line under the assumption that the line intensity follows a Gaussian curve. The results of this calculation are given in the table. It was found, further, that the broadening of the line decreases again during a longer storing (Fig. 2). It had been observed by other research workers (M. S. Paterson, Ref. 2, see below; N. N. Davidenkov, B. I. Smirnov, Izv. AN SSSR, ser. fiz., 23, 624, 1959) that the samples initially deformed at low temperatures showed no broadening of the x-ray lines on further deformation at higher temperatures. This was confirmed experimentally. Since, however, samples deformed at the temperature of liquid helium did not stand a second deformation at 300°K, a cold hardening was carried out by compression between hard plates. In this way (Fig. 3) there occurred a diminution of the line width to about the same value as was observed after maximum stress at 300°K. This shows that the distortions of the crystal lattice became smaller. In general, no essentially different behavior of the x-ray lines from what had already been obtained at 77°K was observed at 4.2°K. The present work was done at the laboratory directed by N. N. Davidenkov and A. V. Stepanov. They and N. M. Reynov, the director of the Cryogenic Laboratory, are thanked. There

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Study of the x-ray ...

3/181/61/003/005/005/042  
B101/B214

are 3 figures, 1 table, and 14 references: 9 Soviet-bloc and 5 non-Soviet-bloc. The 3 most important references to English-language publications read as follows: M. S. Paterson, Acta Met., 2, 823, 1954; A. Kelly, C. S. Robert, Acta Met., 3, 96, 1955; A. L. Titchener, M. B. Bever, Acta Met., 8, 338, 1960.

ASSOCIATION: Fiziko-tekhnicheskii institut imeni akad. A. F. Ioffe AN SSSR Leningrad (Institute of Physics and Technology imeni Academician A. F. Ioffe, AS USSR, Leningrad)

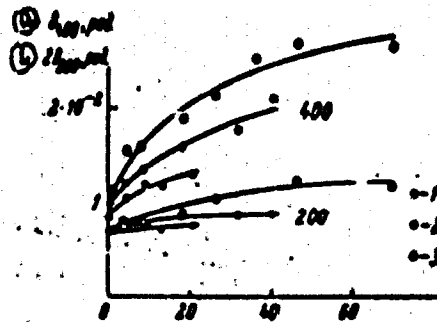
SUBMITTED: December 1, 1960

Fig. 2. The width of the 400 and 200 x-ray line as function of the deformation.

Legend: 1) 300°K; 2) 77°K; 3) 4.2°K; a)  $\Delta_{400}$ , rad; b)  $2\Delta_{200}$ , rad.

$2\Delta_{200}$ , rad.

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8/181/61/003/005/005/042  
B101/B214

Study of the x-ray ...

Fig. 3. Dependence of the width of the 400 x-ray line of aluminum deformed in liquid helium on the duration of their storage at 300°K.

Legend: a) t, days; b)  $v \cdot 10^2$  rad;  
(+) after cold hardening at 300°K.

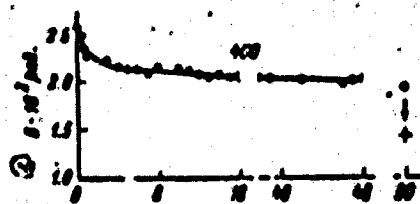


Fig. 3

Table

$\Delta \lambda, \text{\AA}$	$\lambda, \text{\AA}$	$D, \text{m}^{-1}$	$\frac{D}{\lambda}, \text{m}^{-1}$
300	20	5	5
78	20	2	6
4.5	20	1	7
4.5	70	0.6	10

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20216

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5/126/61/011/002/015/025

E111/E452

AUTHOR: Klyavin, O.V.

TITLE: Mechanical Properties of Solids, Especially Metals,  
at  $T = 4.2^{\circ}\text{K}$  and Below. VI. Influence of Preliminary  
Deformation on the Mechanical Properties of Cadmium,  
Armco-Iron and Tantalum

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.2,  
pp.281-284

TEXT: The author reports a continuation of his previous work (Ref.1), the method of investigation, specimen shape and dimensions and grades of metals being as described in his work with A.V.Stepanov (Ref.2 to 6) and B.I.Smirnov (Ref.7). The object was to study the effect of extension at 300 and  $4.2^{\circ}\text{K}$  on the mechanical properties of polycrystalline cadmium (99.98%), armco-iron and tantalum ( $\text{Ta} + \text{Nb} = 99.74\%$ ) at  $4.2^{\circ}\text{K}$  in the annealed and unannealed states. The tensile stress ( $\text{kg/mm}^2$ ) strain (%) diagram for cadmium is shown in Fig.1: curve 1 refers to  $4.2^{\circ}\text{K}$ ; curve 2 to  $300^{\circ}\text{K}$  after 6% deformation at  $4.2^{\circ}\text{K}$ ; curve 3 to  $300^{\circ}\text{K}$ ; curve 4 to  $4.2^{\circ}\text{K}$  after 9.8% deformation at  $300^{\circ}\text{K}$ .

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20216

Mechanical Properties of ...

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E111/E452

Preliminary deformation at either temperature has practically no effect on the diagram for either temperature. The nature of fracture at 4.2°K is also unaffected by preliminary deformation. Apparently crystal-lattice distortion produced by low-temperature deformations are largely removed by heating to 300°K (for 17 min). For armco-iron the stress-strain diagrams are given in Fig.2. For this material 78°K was added to the test temperatures. Curves 1, 4 and 5 refer to annealed specimens, 1 to 300°K, 4 to 78°K and 5 to 4.2°K after 4% deformation at 300°K; curves 2, 3 and 6 refer to unannealed specimens at 300, 78 and 4.2°K, respectively. The nature of the fracture was affected by preliminary deformation. Preliminary work hardening produced as a result of preparing the specimen at room temperature has little effect on mechanical properties at any of the test temperatures. Unannealed specimens fractured at higher stresses than annealed or preliminarily deformed ones. Fig.3 gives stress-strain curves for tantalum: curves 1, 2 and 4 refer to annealed specimens, respectively, at 300°K, at 4.2°K after 7% deformation at 300°K, and at 4.2°K; curve 3 refers to unannealed specimens at 4.2°K. There is a sharp dip in the curve before fracture for the

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Mechanical Properties of ...

S/126/61/011/002/015/025  
E111/E452

specimen deformed at 300°K. A similar dip has been observed (Ref.4) but at a lower temperature (1.6°K). As with armco iron the unannealed specimen at 4.2°K fractures at a higher stress than either annealed or preliminarily deformed ones. Conclusions: 1) preliminary deformation and work hardening at 300°K has little effect on the mechanical properties at 4.2°K of the test metals, the effect being much less than with copper, aluminium or nickel (Ref.1); 2) preliminary deformation at 300°K affects the fracture of armco iron and on the appearance of dips in the stress-strain curve before fracture of tantalum at 4.2°K. Acknowledgments are expressed to Professor A.V.Stepanov and N.M.Reynov for their assistance. There are 3 figures, 3 tables and 8 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR g. Leningrad  
(Physicotechnical Institute AS USSR, Leningrad)

SUBMITTED: February 10, 1960

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20216

Mechanical Properties of ...

S/126/61/011/002/015/025  
E111/E452

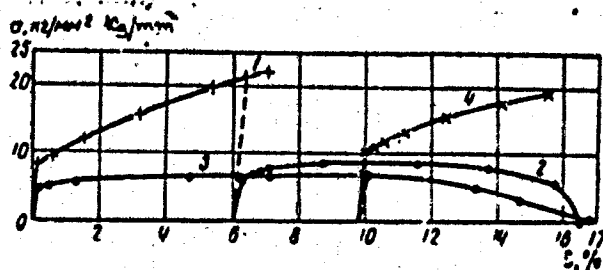


Рис. 1. Диаграммы растяжения отожженного свинца (99,98%) при разных температурах:  
1 — 4.2° K; 2 — 300° K после 6% деформации при 4.2° K; 3 — 300° K;  
4 — 4.2° K после 9.5% деформации при 300° K.

Fig.1.

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Mechanical Properties of ...

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E111/E452

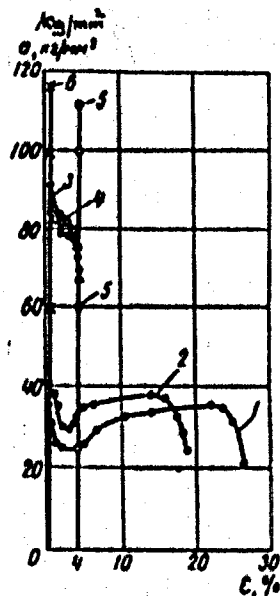


Fig. 2.

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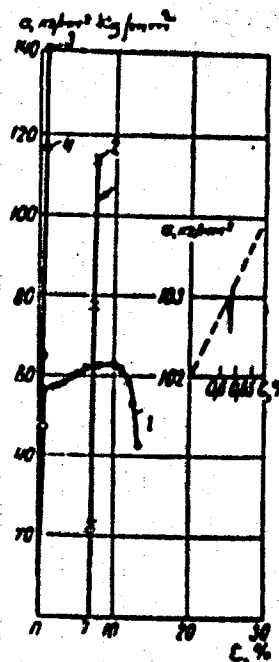


Fig. 3.

KLYAVIN, O. Y., Cand. Phys-Math. Sci. (diss) "Investigation of Properties of Strength and Plasticity of Solid Bodies, Particularly Metals, Under Temperatures of Liquid Helium." Leningrad, 1961, 14 pp. (Leningrad Polytech. Inst. im. M. I. Kalinin)  
150 copies (KL Supp 12-61, 252).

KLIAVIN, O.V.; SMIRNOV, B.I.

Studying the width of the X-ray lines of aluminum deformed at 4.2° K.  
Fiz.tver.tela 3 no.5:1335-1337 My '61. (MIRA 14:6)

1. Fiziko-tekhnicheskiy institut imeni akademika A.F.Ioffe AN SSSR,  
Leningrad.

(X-ray spectroscopy) (Aluminum-Spectra)

KLYAVIN, O.V.

Mechanical properties of solids especially metals at temperatures of  $4.2^{\circ}$  K and lower. Part 6: Effect of prestressing on the mechanical properties of cadmium, armco iron and tantalum. Fiz. met. i metalloved. 11 no. 2:281-284 P '61. (MIRA 14:5)

1. Fiziko-tehnicheskiy institut AN SSSR, g. Leningrad.  
(Metals at low temperature) (Deformations (Mechanics))

S/032/63/029/004/008/016  
A004/A127

AUTHOR: Kiyavin, O.V.

TITLE: Mechanical testing of solids at very low temperatures (20 - 1°K)

PERIODICAL: Zavodskaya laboratoriya, no. 4, 1963, 461 - 474

TEXT: The author presents a survey on the work and investigations that have been performed hitherto to study the mechanical behavior of solids at very low temperatures. He enumerates the special requirements that are made on apparatus operating in a temperature range of 20 - 1°K, presents the basic results obtained in testing the strength and ductility of crystalline bodies in this temperature range and points out that the mechanical properties of metals and alloys at this temperature are changing in different ways, although they all show an increase in yield point ( $\sigma_s$ ), true strength ( $\sigma_k$ ) and hardness. A detailed description of apparatus and installations used for the testing of materials at T = 20 - 1°K is given. There are 8 figures.

Card 1/1

KLYAVIN, O.V.; SMIRNOV, B.I.

Effect of preliminary plastic deformations on the brittle strength  
of steel at 4.20°K. Fiz. met. i metalloved. 16 no.1:134-136 J1'63.  
(MIRA 16:9)

1. Leningradskiy fiziko-tekhnicheskii institut imeni A.F.Ieffe AN  
SSSR.

(Steel--Brittleness) (Deformations (Mechanics))

ACCESSION NR: AP4029005

S/0126/64/017/003/0459/0466

AUTHOR: Kiyavin, O. V.

TITLE: On the effect of deformation speed on the intermittent deformation of aluminum at  $T = 1.3^{\circ}\text{K}$

SOURCE: Fizika metallov i metallovedeniye, vol. 17, no. 3, 1964, 459-466

TOPIC TAGS: deformation speed, intermittent deformation, aluminum, polycrystalline aluminum, low temperature

ABSTRACT: In this paper the author studies the influence of deformation speed on the intermittent plastic deformation and mechanical properties of polycrystalline aluminum at  $1.3^{\circ}\text{K}$ . This research is a continuation of previous work by the author (Kiyavin, O. V.; Stepanov, V. A. FTT, 1959, vol. 1, no. 11, p. 1733; Kiyavin, O. V. FTT, 1960, vol. 2, no. 8, p. 1891; Kiyavin, O. V. FTM, 1961, vol. 11, no. 2, p. 281) in which a study was made of the effect of certain parameters on the appearance and regularity of intermittent deformation of aluminum in the region of helium temperatures. The results of this work were presented at the VIII All-Union Congress on Low Temperature Physics, Kiev, Oct. 1961. Tensile diagrams of aluminum at  $1.3^{\circ}\text{K}$ , as well as microphotographs of aluminum surfaces are included in this paper. With

Cord 1/2

ACCESSION NR: AP4029003

an increase of the deformation speed of 500 times (from  $2 \cdot 10^{-5}$  to  $1 \cdot 10^{-2} \text{ sec}^{-1}$ ) at 1.3°K, a tensile diagram of the samples of polycrystalline aluminum (99.3%) initially acquires a wavy character and then becomes intermittent. At a temperature of  $T = 1.3^\circ\text{K}$ , the character of the deformation speed influence on the mechanical characteristics of aluminum deformation changes in comparison with high temperatures. The author expresses his thanks to A. V. Stepanov for his interest in the article and discussion of the results. Orig. art. has: 5 figures

ASSOCIATION: Fiziko-tekhnicheskiv institut im. Ioffe AN SSSR (Physical Technical Institute, AN SSSR)

SUBMITTED: 25Mar63

DATE ACQ: 27Apr64

ENCL: 00

SUB CODE: ML

NO REF SOV: 010

OTHER: 007

Cord 2/2

ACCESSION NR: AP4034057

S/0126/64/017/004/0592/0600

AUTHORS: Klyavin, O. V.; Stepanov, A. V.

TITLE: The influence of the state of the surface on the unevenness of deformation of aluminum at a temperature of 1.3K

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 4, 1964, 592-600

TOPIC TAGS: plastic deformation, tensile stress, grain size, yield stress, aluminum/ AD 1 aluminum rod, PMT 3 microhardness apparatus

ABSTRACT: The authors studied the effect of surface conditions obtained by different metal treatments (cold working, annealing, pickling, electropolishing) and of grain size on the unevenness of plastic deformation (under tension) of polycrystalline Al (99.3%) at 1.3K. The specimens were prepared from AD-1 brand rods in the form of pins having a working length of 20 mm and a diameter of 2 mm. The grain sizes used were 130-150 microns (annealed at 400C for 3 hours). The studies were conducted on specimens having 3 different surface conditions: 1) after electropolishing in solutions of 250 ml of glycerine, 168 ml of methyl alcohol and 70 ml of HCl; 2) after chemical pickling in solutions of HCl for 9 hours, HNO<sub>3</sub> for 3 hours, HF for 2 hours, and H<sub>2</sub>O for 5 hours; 3) in the original state

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ACCESSION NR: AP4034057

after preparation of the specimen. After the surface treatment at room temperature, the specimens were cooled to 1.3K and deformed until failure by tension in a machine described in an earlier work by the authors (FIZM, 1959, 8, 274). The microhardness of the surface of the working part was tested in a PHT-3 apparatus at 300K at a load of 1 g. In the stress-strain diagram of the unannealed specimens with pickled surfaces, a sharp decrease in the value of the yield limit from 17 to 2 kg/cm<sup>2</sup> was observed, and there was also a sharp decrease in the number of tracks. Electropolishing also decreased the number of tracks, but this effect was considerably weaker than in the case of pickling. The plot of the number of tracks versus the diameter of the specimens showed an abrupt occurrence of a minimum. The behavior of annealed specimens was essentially different from that of the unannealed specimens. In the first case polishing and pickling reduced the number of tracks roughly by the same degree. This effect was not as pronounced as in the case of unannealed specimens. Moreover, the range of diameters where the number of tracks reached a minimum was twice as large as that in the case of unannealed specimens. The increase of grain size caused an increase in the unevenness of deformation and an increase in the number of tracks. The authors thank B. I. Sidorov and L. P. Vakhayanin for helping with the measurements. Orig. art. has: 5 figures.

Card 2/3

ACCESSION NR: AP4034057

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR (Physico-technical Institute, AN SSSR)

SUBMITTED: 24Apr64

ENCL: 00

SUB CODE: MM

NO REF SOV: 013

OTHER: 001

Card 3/3

STEPANOV, A. V.; KLYAVIN, O. V.

"Mechanical properties of crystalline bodies at liquid helium temperatures."

paper submitted for Intl Conf on Fracture, Sendai, Japan, 13-16 Sep 65.

Leningrad Physico-Tech Inst.

STEPANOV, A. V.; KLYAVIN, O. V.

"Mechanical properties of crystalline bodies at liquid helium temperatures.

Phys-Tech Inst, AS USSR

report submitted for Intl Conf on Fracture, Sendai, Japan, 12-17 Sep 65.

2 57100-45 271(a)/271(b)/271(c)/271(d)/271(e) Ps-4 LIT(c) 30  
 ACCESSION NR: AP5016537 UR/0126/65/019/006/0937/0939  
 539.4 35

TITLE: Investigation of SAP material strength at 4.2-1.3K

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 6, 1965, 937-939

TOPIC TAGS: sintered aluminum powder, SAP alloy, SAP strength, low temperature strength, SAP property

ABSTRACT: The mechanics properties of SAP alloy containing 18%  $Al_2O_3$  have been tested at 300, 400, 500, and 600 K. It was found that the alloy deforms without apparent yield point. The ultimate strength is 40 kg/cm<sup>2</sup> at 300K, 39 kg/cm<sup>2</sup> at 400K, 36 kg/cm<sup>2</sup> at 500K, and 34 kg/cm<sup>2</sup> at 600K.

Cont 1/2

L 57108-65

ACCESSION NR: AP5016537

APPROXIMATE DATE: 1965 (Approximate)

SUBMITTED: 09/19/65

ENCLOSURE: 00

SUB CODE: 10

NO REF SOV: 005

OTHER: 000

ATD PRF88: 4036

Card 2/2

DAVLETBAYEV, D.Sh.; KHANGIL'DIN, G.N.; KLYAVIN, R.M.; ADLER, E.N.

Using slag-portland cement for oil well cementing. Neft. khoz. 40  
no.8:20-23 Ag '62. (MIRA 17:2)

CHEREMEN, G.N.; NYAVIN, H.N.

Filter loss of cement slurries. Neft.khoz. 41 no.8:26-27 Ag. '63.  
(MIRA 17:10)

NOZDRIUKHIN, V.K.; KHEYTEL, A.A.; KLYAVIN, V.; ELIZOV, I.; SUSLOV, V.P.;  
PAK, V.A., kand. geol.-min. nauk; YAKOVLEV, V.N.; LESNIK, Yu.N.;  
KOROLEV, I.A.; RACHKULIK, V.I.; TACHKOVA, N.A.; KOLESHNIKOVA,  
V.N., kand. fis.-mat. nauk; HASYROV, M.; SHULITS, V.L., doktor  
geolgr. nauk, prof., otv. red.; GAYSINSKAYA, I., red.; MASHARIPOVA, D.,  
red.; GOR'KOVA, Z.P., tekhn. red.

[Fedchenko Glacier] Lednik Fedchenko. Tashkent, Izd-vo Akad. nauk  
Uzbekskoy SSR. Vol.1. 1962. 247 p. (HIRA 15:8)

1. Akademiya nauk Uzbekskoy SSR, Tashkent. Institut matematiki.  
(Fedchenko Glacier)

KLYAVIN, V.I.  
SMIRNOV, L.N., inzhener; KLYAVIN, V.I., inzhener.

Reconstruction along the Yausa River. Gor.khos.Mosk. 28 no.9:21-  
24 8 '54. (MLRA 7:10)  
(Yausa River--Hydraulic engineering) (Hydraulic engineering--  
Yausa River)

KHURATSEV, G., insth.; KLYAVIN', Ya. (Riga)

Polyester lacquers. Posh.delo 6 no.12:29 D '60. (MIRA 13:12)  
(lacquer and lacquering)

KIRKO, I.M.; KLYAVIN', Ya.Ya.; TYUTIN, I.A. [deceased]; UL'MANIS, L.Ya.

Model of an infinitely long channel containing liquid metal  
exposed to a traveling magnetic field. Nauch.dokl.vys.shkoly;  
energ. no.3:203-210 '58. (MIRA 12:1)

1. Rekomendovano Institutom fiziki AN Latvyskoy SSR.  
(Magnetohydrodynamics--Models)



KLYAVIN, Ya. Ya.

**STAY**

1944-45. 1944-45. 1944-45.

Drawing together thousands of diabolical plots, truly infernal.  
 (Children & Independent) and at Plains Road; Transactions of a  
 (children) High, 1st-100 at London SW, 1979. 343 p.  
 From also known. 1,000 copies printed.

**Remedies Against Inflation and Poverty 68. Justice Clark.**

Received March 24, 1964; in final form May 11, 1964. This work was supported by the National Institute of Mental Health, Grant MH-10,000. The authors are grateful to Dr. J. H. W. Lamont for his critical reading of the manuscript and to Dr. J. H. W. Lamont for his critical reading of the manuscript.

**STANDARD & POOR'S 500 STOCK INDEX**

known. This book is intended for persons working in the fields of super-  
hydrogenation and plasma physics.  
The book is written in English. It contains the translation of a conference held in Baku,  
June 1966, on problems in applied and theoretical superhydrogenation. The  
contents of the conference were the investigation of the basic trends in the  
development of superhydrogenation, the investigation of the mechanism of the  
process and applied superhydrogenation, the investigation of the mechanism of the  
process taking account of different physical principles in problems in applied  
superhydrogenation. The book contains 140 papers from different parts of the Soviet  
Union and 10 papers from the conference, and 25 papers were read. Similar conferences  
will be held in the future. In this present collection of the translations of  
the papers read at the conference, most of the papers and comments are presented by the  
authors themselves in a shortened form. The book is divided into two parts:  
the first part deals with problems in theoretical superhydrogenation and plasma  
physics, and consists of 25 articles on such aspects of the problem as the  
mechanism of superhydrogenation in supercritical (S.H. Pechenkin, 1966), super-  
hydrogenation and the investigation of complex systems (A. I. Buzinov),  
superhydrogenation of plasma in a magnetic field (A. I. Buzinov), The chemical  
stability of chain ions and superhydrogenation of supercritical hydrogen  
peroxide, containing 25 articles on the mechanism of superhydrogenation for hydrocarbons  
and hydrocarbons, the mechanism of superhydrogenation of supercritical hydrogen  
peroxide, the mechanism of superhydrogenation of supercritical hydrogen peroxide  
of supercritical gases (S. A. Buzinov), on the kinetics of reaction of the  
reaction of hydrogen, carbon monoxide, several articles are devoted to industrial  
superhydrogenation reactions, superhydrogenation of polymers for polymer synthesis,  
and their application in the metallurgical industry including aluminum,  
stages of their super-supply systems. References are given at the end of  
each of the articles.

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Thalig, E.A. Investigating the System of Equations for a Conducting  
Field in a Two-Dimensional Steady State

**SECRET**

Slater, J.R. Assistant Records and Political Modeling is Investigating  
Administrative Problems in Idaho State

三、關於「三民主義」之解釋

THE UNIVERSITY OF CHICAGO PRESS

**Dr. J. H. Smith, Jr., President, and Dr. R. B. Thomas.**

model of a channel of circulation through a liquid metal pressure

**THE**

**15**

VEER, A.; KLYAVIN'SH, Ya. [Klavins, J.]

Effect of rotating magnetic fields on turbulent heat transfer  
in mercury. In Russian. Vestis Latv ak no.5:67-70 '60.

(KRAI 10:7)

(Magnetic fields) (Mercury)

24.2300 1068, 3108, 1534, 1482, 1144

31625  
S/197/61/000/012/003/003  
B117/B108

AUTHORS: Dobryakov, D., Krumin', Yu., Klyavin', Ya., Nikolayev, V.

TITLE: Investigation of the possibility of conveying spherical  
conductive bodies by means of a magnetic traveling field

PERIODICAL: Akademiya nauk Latvyskoy SSR. Izvestiya, no. 12 (173), 1961,  
55 - 60

TEXT: Ponderomotive forces were determined, which are necessary for  
conveying solid and hollow spheres placed in the magnetic traveling field  
of a cylindrical inductor. Experiments were conducted to convey solid  
spheres of various materials in a magnetic traveling field inductor under  
dynamic conditions. For the motion of a sphere in a tube, an approximate  
equation was derived under the following assumptions: (1) the friction is  
proportional to the velocity of the sphere,  $F_{\text{friction}} = kv$ ; (2) the  
acceleration of the sphere is constant,  $dv/dx = a = \text{const}$ ; (3) the  
electromagnetic force  $F_{\text{em}}$  does not change with velocity (holds for a small  
range of velocities); (4) the energy consumed by the rotation of the sphere  
Card 1/3

Investigation of the possibility...

S/197/61/0007012/003/003  
B117/B108

during its motion is neglected (holds for angle  $\alpha$  close to  $90^\circ$ ). The final equation is:  $P_1 = (a/g) + \sin \alpha$ , where  $P_1 = (P_{em} - P_{friction})/mg$  ( $m$  = mass of the sphere). This equation was checked experimentally (Fig. 5). The abscissae  $\bar{H}$  are the ratios between the field in the inductor and the field at which the sphere floats (then,  $\bar{H} = 1$ ). The measurements were made for 3 angles of inclination of the tube (inductor):  $\alpha = 90^\circ$ ,  $60^\circ$ , and  $30^\circ$ . The field in the inductor, in the direction of its propagation, does not take an exactly sinusoidal course, so that stronger and weaker field sections alternate along this direction. At a certain field strength, a stronger field section develops below the sphere, which keeps it from falling. Above the sphere, a weaker field section develops, not sufficiently strong to lift it. This mechanism keeps the sphere afloat. Spheres of different materials but equal diameter have equal  $P_1$ -versus- $\bar{H}$  curves at every specific angle. The mean velocity of the sphere was also calculated. It is shown as a function of  $\bar{H}$  in Fig. 6.  $\bar{v}$  is the ratio between velocity of the sphere in the presence of the field and the fall velocity without magnetic field. The absolute values of  $\bar{v}$  are plotted as ordinates. It is characteristic that all experimental points for all angles lie on a common

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31625

S/197/61/000/012/003/003

B117/B108

Investigation of the possibility...

curve and are distributed among 3 sections: section (a) characterizes deceleration, (b) the floating suspension, and (c) the lifting of the sphere. Copper- and aluminum spheres were used in the experiments. For lifting tin and lead spheres, very high field strengths are necessary which were not reached in the experiments. Nevertheless, the experimental points showed the tendency of lying on the common curves (Figs. 5, 6). The investigations permit determining the parameters of ponderomotive conveyers. There are 6 figures and 2 Soviet references.

ASSOCIATION: Institut fiziki AN Latv. SSR (Institute of Physics AS  
Latviyskaya SSR)

SUBMITTED: April 5, 1961

Card 3/5

2

ACCESSION NR: AT4042291

S/0000/63/003/000/0137/0152

AUTHOR: Bushman, A. K.; Veklenko, I. A.; Kiyavin', Ya. Ya.; Lielpeter, Ya. Ya.

TITLE: Design development of electromagnetic induction pumps at the Physics Institute of the Academy of Sciences of the Latvian SSR

SOURCE: Soveshchaniye po teoreticheskoy i prikladnoy magnitnoy gidrodinamike. 3d, Riga. 1962, Voprosy\* magnitnoy gidrodinamiki (Problems in magnetic hydrodynamics); doklady\* soveshchaniya, v. 3. Riga, Izd-vo AN LatSSR, 1963, 137-152

TOPIC TAGS: hydromagnetics, electromagnetic induction pump, cylindrical induction pump, spiral induction pump, straight line pump, liquid metal pump, induction pump design, induction pump cooling system, flow channel insulation, flow channel configuration, magnetic circuit design, pump IN-1, pump IN-4, pump IN-8, pump IN-9, pump IN-10, pump IN-11, pump IN-14, pump SIN-1, pump SIN-3

ABSTRACT: The report presents a brief survey of a number of designs developed at the Institut fiziki AN Latvyskoy SSR (Physics Institute of the Latvian Academy of Sciences) in recent years; specifications and performance characteristics are tabulated. The designs included straight line, spiral and cylindrical electromagnetic induction pumps designed for the transfer of Na, Hg, NaK, Pb and InCa in the liquid state, operating at temperatures of 50 (Hg) to 650C (Na) and line fre-

Card 1/2

ACCESSION NR: AT4042291

quencies of 50 cycles/sec., and employing liquid or natural convection cooling systems. General discussion topics include the preselection of basic design characteristics in relation to the overriding operational requirements, the configuration and construction materials of channels, methods of mounting magnetic circuits, and the selection of cooling systems and heat insulating materials for the flow channel. Orig. art. has: 10 figures and 4 tables.

ASSOCIATION: Institut fiziki AN Latvyskoy SSR (Physics Institute, AN Latvian SSR)

SUBMITTED: 04Dec63

ENCL: 00

SUB CODE: ME

NO REF SOV: 002

OTHER: 001

Card 2/2

L 43715-65 EWT(1)/EPA(s)-2/EPF(n)-2/EPR/T-2/EPA(bb)-2 Ps-4 GS  
 ACCESSION NR: AT5009760 UR/0000/64/004/000/0115/0127

AUTHOR: Abritska, M. Yu., Klyavin', Ya. Ya.

TITLE: Calculation of temperature fields within induction pumps with liquid cooling

SOURCE: Soveshchaniya po teoreticheskoy i prikladnoy magnitnoy gidrodinamike. 3d,  
 Riga, 1962. Voprosy magnitnoy gidrodinamiki (Problems in magnetic hydrodynamic);  
 doklady soveshchaniya, v. 4. Riga, Izd-vo AN LatSSSR, 1964, 115-127

TOPIC TAGS: inductor temperature field, liquid cooling induction pump, induction pump temperature, electromagnetic pump

ABSTRACT: During the design of electromagnetic induction pumps, it is necessary to calculate the average and maximum temperature excesses within operating parts. Such pumps often have liquid cooling devices, and the present paper investigates, theoretically and experimentally, the magnetic conductor back-edge cooling and the direct groove cooling with the cooling system placed between the coil and the heat insulation of the channel. The stationary temperature field distribution within the inductor of the induction pump is determined by a system of thermal conductivity. Since each particular design incorporates specified geometry, given material properties, and definite boundary conditions, the calculation of the temperature at any point of the conductor is theoretically possible. To simplify the

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L 43715-65

ACCESSION NR: AT5009760

otherwise cumbersome calculations the authors assumed 1) that the temperature distribution along the pump's length is a periodic function with a period equal to the pitch of the grooves; 2) that there is no temperature drop across the width of the inductor (the problem becomes two-dimensional); and 3) that the true heat conduction coefficients in the nonhomogeneous portions of the inductor may be replaced by some average coefficients which may be found mathematically or empirically. The results of the calculations are shown in the form of graphs and tables and are compared with experimental data. The agreement is fair, and the computation method can be used for the estimate of possible temperature influences on the operation of the inductors. "The program for the calculations was developed at the Vychislitel'nyy tsentr Latvyskogo gosudarstvennogo universiteta (Computer Center, Latvian State University) under the direction of V. E. Aboliz. Technical assistance was also received from B. B. Levi and U. I. Raytum of the Computer Center, and from G. B. Chervas of the Institut fiziki AN Latv.SSR (Physics Institute AN Latv.SSR)." Orig. art. has: 4 formulas, 7 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 11Aug64

ENCL: 00

SUB CODE: HZ

NO REF SOV: 004

OTHER: 000

Card 2/2

L 62216-65 ENT(1)/ENP(m)/EPA(s)-2/ENT(m)/EPA(sp)-2/EPF(n)-2/ENG(v)/EIN/EPA(m)-2/  
T-2/ENP(t)/ENP(b)/ENA(m)-2 Pd-1/Pe-5/Pe-4/Pt-7/P1-4/Pu-4 IJF( ) JD/M/JG

ACCESSION NR: AP5014186

UR:0382/65/000/00:/0129/0140

539.4 : 621.313.3:3

AUTHOR: Abritska, M. Yu.; Klyavin', Ya. Ya.

TITLE: Determination of the optimum cooling method for the electromagnetic induction pump

SOURCE: Magnitnaya gidrodinamika, no. 1, 1965, 129-140

TOPIC TAGS: liquid metal pump, magnetohydrodynamics, cooling

ABSTRACT: Assessment of the effectiveness of two air- and two liquid-cooling methods for temperature control of the induction pump is presented. The methods discussed are those that are employed by the Institute of Physics, Academy of Sciences Latvian SSR. To determine the effectiveness of particular cooling method relatively simple schematics are constructed accounting for various losses in the pump components. The essential point of the method is that the wrong choice of thermal losses and thermal conduction is reflected in the final results and determination of the loss input data can be adjusted by more precise computation. Data for certain pumps are presented. Some computations are given to show the effect of variation of coil

Card 1/2

L 62216-65

ACCESSION NR: AP5014186

winding losses on the pump cooling for each of the four cooling methods discussed. The analysis provides the designer with the simplest cooling method for the required electrical loads.

ASSOCIATION: none

SUBMITTED: 020ct64

ENCL: 00

SUB CODE: IE,TD

NO REF SOV: 005

OTHER: 000

Card 2/2

ACC NR: AP6034586

(N)

SOURCE CODE: UR/0382/66/000/003/0135/0145

AUTHOR: Kiyavin', Ya. Ya.

ORG: none

TITLE: Temperature and thermal current distribution in a linear three-phase magneto-hydrodynamic machine with indirect cooling of the windings

SOURCE: Magnitnaya gidrodinamika, no. 3, 1966, 135-145

TOPIC TAGS: MHD generator, heat equation, temperature distribution

ABSTRACT: The solution of the problem of stationary distribution of temperature and thermal currents in MHD generators with indirect cooling is given to provide the criteria for improving the design of such machines. The problem is formulated and the effects which can be neglected are enumerated for the case of a simplified structure. The solution of the heat equation is obtained by employing Fourier analysis of three separate components of the machine, i.e. for the insulation of conductors in magnetic field coils, for a fluid channel and for a cooling medium. These three phases are mutually dependent and their interactions are discussed. The procedure for using the results of one phase as boundary conditions for the other requires some reiteration. Orig. art. has: 64 formulas, 2 figures.

SUB CODE: 20/ SUBM DATE: 23Feb66/ ORIG REF: 001/ OTH REF: 000

Cord 1/1

UDC: 538.4

**KLYAVINA, N.P.**

Generalisation of a conditioned sound reflex during early postnatal development in animals born at relatively mature and immature stages of development. Trudy Inst. fiziol. 6:429-436 '57. (MIRA 11:4)

1. Laboratoriya sravnitel'nogo ontogenesa vysshey nervnoy deyatel'nosti (sveduyushchiy V.A. Troshikhin).  
(CONDITIONED RESPONSE)